Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

Valero Refining Co - New Orleans LLC
Valero Refining Co - New Orleans LLC - St Charles Refinery
Norco, St. Charles Parish, Louisiana
Agency Interest Number: 26003
Activity Number: PER20080005
Proposed Permit Number: 2520-00027-V6

I. APPLICANT

Company:
Valero Refining Co - New Orleans LLC - St Charles Refinery
Post Office Box 518
Norco, Louisiana 70079-0518

Facility:
Valero Refining Co - New Orleans LLC
14902 River Road
Norco, St. Charles Parish, Louisiana
UTM Coordinates: 751.9 kilometers East and 3319.9 kilometers North, Zone 15.

II. FACILITY AND CURRENT PERMIT STATUS

St. Charles Refinery refines heavy, sour crude oil to produce gasoline, distillates (kerosene, naphtha, diesel, etc.), petrochemicals, sulfur, and petroleum coke. The crude feed stock is typically brought in via ship and the products are moved via barge or pipeline.

The refinery is divided into the West Plant, East Plant, and Tank Farm. The West Plant consists of the following units: Crude Unit No. 2, Vacuum Unit, Diesel Hydrotreater, Kerosene Hydrotreater, Light Straight Run Hydrotreater, Naphtha Hydrotreater, Heavy Cat Naphtha Hydrotreater, Continuous Catalytic Reformer, and Delayed Coker.

The East Plant consists of the following units: Fluid Catalytic Cracking Unit, Alkylation Unit, Utilities Unit (boilers, cooling towers, wastewater treatment unit, reverse osmosis unit, and river water clarification unit), Sulfur Recovery Units, Ultra Low Sulfur Diesel (ULSD) Unit, Liquefied Petroleum Gas (LPG) Storage and Processing, Steam Methane Reformer (SMR), and a gasoline desulfurization unit (GDU).

The Tank Farm includes the East Plant Tank Farm, West Plant Tank Farm, New Sarpy Tank Farm, Section I Tank Farm, Section II Tank Farm, Section III Tank Farm, Product Loading and Unloading Docks.

Valero Refining Co - New Orleans LLC
Valero Refining Co - New Orleans LLC - St Charles Refinery
Norco, St. Charles Parish, Louisiana
Agency Interest Number: 26003

St. Charles Refinery (Orion Refining Corporation) signed a Settlement Agreement with the Louisiana Department of Environmental Quality (LDEQ) on December 19, 2002. By this agreement, St. Charles Refinery agreed to implement the Benzene Waste Operations NESHAP (BWON) Enhancement Program, Leak Detection and Repair (LDAR) Program, Flaring Enhancement Program, Additional Program Enhancements, and Beneficial Environmental Projects (BEPs). The limitation and monitoring requirements for NO_X and SO_2 emissions from heaters, boilers, and the FCCU which are specified in the Additional Program Enhancements Section of the Settlement Agreement are incorporated in the permit.

On November 23, 2005, Valero also entered into a Consent Decree with the US-EPA and other states, including Louisiana. According to the Consent Decree, Valero will implement several projects to reduce emissions from the St. Charles Refinery.

Certain of the reporting requirements from the Valero Consent Decree were put in the permit. It requires the permittee to:

Submit a report by March 31st of each year during the effective term of the Valero Consent Decree lodged June 16, 2005. For each heater equipped with a CEMS and either ULNB or SCR to achieve compliance with the Valero Consent Decree, the report shall include the following information: (1) EQT Number and source description, (2) Permitted NOx lb/MMBtu, (3) Permitted NOx tons per year, (4) Actual performance NOx lb/MMBtu for the previous calendar year, and (5) Actual emissions NOx, tons per year, for the previous calendar year.

Valero Refining Co - New Orleans LLC - St Charles Refinery is a designated Part 70 source. It currently operates under Permit 2520-00027-V5 and PSD-LA-619(M3), dated July 17, 2007.

III. PROPOSED PROJECT/PERMIT INFORMATION

Application

A permit application dated March 20, 2008 as well as additional information dated May 16 and June 16, 2008 were submitted requested a Part 70 operating permit modification.

Project

On February 8, 2007, Permit PSD-LA-619(M2) and 2520-00027-V4 were issued authorizing Valero Refining – New Orleans, LLC (Valero) to implement the Refinery Expansion Project to increase the St. Charles Refinery production capacity from 220,000 bbls/day to 380,000 bbls/day by installing new processing units and modifying existing production units. The permits were then amended and modified.

Valero proposes to significantly revise the scope of the Refinery Expansion Project. The revised project is known as the Revised Scope Refinery Expansion Project. Valero has revised the planned refinery expansion in conjunction with Valero's business plan for compliance with 40 CFR 80.1220, the federal Mobil Source Air Toxics (MSAT) II regulations, which requires Valero to significantly reduce benzene concentration in

gasoline by December 31, 2010. Reducing benzene from gasoline will increase the aromatic production. Valero proposes to increase the size of the permitted Aromatic Recovery Unit (ARU). The ARU will consist of a Sulfolane extraction Unit, a Tatoray Process Unit and two Paraxylene Units. Other changes include modification to the existing continuous reformer area (CCR) and installation of a new CRU, which will be collocated with the new ARU, and supporting facilities. While the CRU/CCR is traditional refinery process unit, the ARU is a SOCMI unit, thus the two units will be treated as distinct for regulatory applicability purposes. Firing rate of Heater 94-GDU and capacities of cooling towers will also be increased. New process drains will be added. Instead of constructing six heaters at the Hydrocracker Unit (HCU) as permitted, Valero will install only three units under a cap. Several sources previously permitted will not be constructed. In addition, this permit modification also includes the MSCCU Revamp Project and includes multiple permit reconciliation items.

Other unrelated changes include revising the facility tank farm and its cap, consolidating emissions from wastewater into a single emission point (WWTU), and installing an additional thermal oxidizer for the SRU service.

Proposed Permit

This permit (Permit 2520-00027-V6) is a preconstruction and operating (Part 70 or Title V) permit for St. Charles Refinery. The permit also includes provisions of the Prevention of Significant Deterioration (PSD) Permit PSD-LA-619(M4).

Permitted Air Emissions (tons/year)

Pollutant	Permitted	Proposed	Change
PM_{10}	1061.64	976.03	- 85.61
SO_2	3449.39	3041.65	- 407.74
NO_X	3451.09	2414.70	- 1036.39
CO	5595.01	5504.59	- 90.42
VOC	3648.33	3254.24	- 394.09
H_2S	79.65	69.60	- 10.05
H_2SO_4	23.10	23.09	- 0.01
Ammonia	21.23	139.90	+ 118.67(*)
HCl	1.08	0.36	- 0.72
Chlorine	5.77	5.57	- 0.20
Metals	1.938	0.801	- 1.137

(*) Due to the operations of SCR systems

IV REGULATORY ANALYSIS

The applicability of the appropriate regulations is straightforward and provided in the Specific Requirements section of the proposed permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are also provided in the Specific Requirements section of the proposed permit.

Applicability and Exemptions of Selected Subject Items

The explanations for the non-applicability and exemptions of selected subject items are listed in Table XI of the proposed permit.

Prevention of Significant Deterioration/Nonattainment Review

Valero submitted a PSD analysis for the original Refinery Expansion Project in 2005. PSD Permit PSD-LA-619(M2) was issued on February 8, 2007 and was modified on July 17, 2007, for the expansion project. To implement the Revised Scope Refinery Expansion Project, Valero submitted a revised PSD analysis, date March 20, 2008, to incorporate 1) modified existing equipment, 2) modified permitted (but not constructed) equipment, 3) and newly proposed equipment. To perform the actual-to-projected-actual applicability test, Valero used actual emissions from the affected equipment during the 2003 and 2004 calendar years as baseline. The test indicated that the project will cause significant PM/PM_{10}, SO_2, NO_X, CO, VOC, H_2S, and H_2SO_4 emissions increases. Netting analyses are required for these pollutants. The contemporaneous period will be from the first quarter of 2002 (five years prior to the commencement of construction of first quarter of 2007) to the initial startup which is expected to be the first quarter of 2010. The netting analyses show that the project will cause significant net PM/PM_{10}, SO_2, NO_X, CO, VOC, H_2S, and H_2SO_4 emissions increases. According to LAC 33:III.509A.4.b, PSD analyses are required for these pollutants.

BACT analysis is required for all new and affected modified equipment. However, BACT determinations for emissions from affected equipment which was included in PSD Permit PSD-LA-619(M2) and that the equipment will not be changed due to the Revised Scope Refinery Expansion Project are still valid. There are no H_2S or H_2SO_4 emissions increases from the newly proposed or modified equipment (due to the revised project); therefore, PSD analyses are not required for H_2S and H_2SO_4.

Valero also proposes to convert the existing MilliSecond Catalytic Cracking Unit (MSCCU) to a conventional Fluidized Catalytic Cracking Unit (FCCU) under the MSCCU Revamp Project. The conversion is expected to improve the reliability of the unit, thereby reducing unplanned outages with an anticipated corresponding increase in run time of approximately 516 hours/year. The conversion also reduces catalyst losses, thereby, reducing particulate emissions. There is no increase in feed rate or increase in capacity. However, the revamp project is expected to allow a shift in yield, resulting in a potential increase in gasoline yield from the cat cracker by 3000 barrels per day. The MSCCU Revamp Project is implemented along with but is independent from the Revised

Scope Expansion Project. The PSD applicability analyses were conducted separately.

Emissions from the existing MSCCU and other affected equipment were reviewed under PSD regulations and documented in Permit PSD-LA-619(M2). The MSCCU Revamp Project is considered independent from the Revised Scope Refinery Expansion Project.

The MSCCU Revamp Project will cause PM/PM_{10}, SO_2, NO_X, CO, VOC and H_2SO_4 emissions to increase. Valero performed the actual-to-projected-actual applicability test for emissions from the MSCCU Revamp Project and any downstream effects of the 3000 barrel per day in gasoline yield increase. Average emissions from the 2005 and 2006 calendar years were used as baseline. The test showed that the MSCCU Revamp Project will not cause any significant emissions increases. Neither netting analysis nor PSD analysis is required for the MSCCU Revamp Project. However, PM_{10} and SO_2 emissions increases are more than 50% of their respective significance levels, then there is a reasonable possibility that the project will cause significant emissions increases. Pre-project and post-project monitoring, record keeping, and reporting are required.

PSD limits of PM/PM_{10}, SO_2, NO_X, CO, VOC and H_2SO_4 emissions from the affected equipment will be updated and bring forward into Permit PSD-LA-619(M4).

Streamlined Equipment Leak Monitoring Program

It is required that the St. Charles Refinery comply with a streamlined equipment leak monitoring program. Compliance with the streamlined program shall serve to comply with each of the fugitive emission monitoring programs being streamlined.

For the St. Charles Refinery, fugitive emissions are subject to the requirements of 40 CFR 63 Subpart H, LAC 33:III.2122, LAC 33:III.5109, and LA Refinery MACT. Among these regulations, 40 CFR 63 Subpart H and the LA Refinery MACT are the overall most stringent programs. Therefore, fugitive emissions shall be monitored as required by these programs (40 CFR 63 Subpart Hand LA Refinery MACT).

Valero will conduct a leak detection and repair (LDAR) program that meets requirements of the most stringent standards outline in the Specific Requirements Section of the permit and summarized as follows:

Unit or Plant Site	Programs Streamlined	Stream Applicability	Overall Most Stringent Program
Aromatic Recovery Unit (ARU) FUG027	40 CFR 63 Subpart H	5% VOHAP	40 CFR 63 Subpart H
	LAC 33:III.2121	10% VOC	
	LAC 33:III.5109	TAP	
	40 CFR 63 Subpart CC	5% VOHAP	
Refinery FUG026	LA Refinery MACT	5% VOHAP	LA Refinery MACT
	LAC 33:III.2121	10% VOC	
	LAC 33:III.5109	TAP	
	40 CFR 63 Subpart CC	5% VOHAP	
	40 CFR 60 Subpart GGG	10% VOC	

Valero Refining Co - New Orleans LLC
Valero Refining Co - New Orleans LLC - St Charles Refinery
Norco, St. Charles Parish, Louisiana
Agency Interest Number: 26003

MACT Requirements

Toxic Air Pollutants (TAPs) and Hazardous Air Pollutants (HAPs) from various sections of the refinery are controlled as required by LAC 33:III.Chapter 51, 40 CFR 61 Subparts BB and FF, 40 CFR 63 Subparts G, H, CC, and UUU, using thermal oxidizers, flares, fixed and floating roofs for tanks, etc,..

Air Quality Analysis

PSD regulations require an analysis of existing air quality for those pollutant emissions, which increase significantly from a proposed major modification. PM_{10}, SO_2, NO_2, and CO are the pollutants of concern in this case. Valero performed an air quality analysis for the original Refinery Expansion Project in 2006.

Screening dispersion modeling indicated that concentration of PM_{10} (24-hour and annual average), SO_2 (3-hour, 24-hour, and annual average), and NO_2 (annual average) were above the modeling significance impact levels. Increment analysis and refined NAAQS modeling are required. The SO_2 (24-hour average) concentration was above the preconstruction monitoring exemption level of 13 $\mu g/m^3$. Preconstruction monitoring was required. Valero used the monitoring data from the nearby LDEQ monitoring station in Hahnville, Louisiana, to fulfill the preconstruction SO_2 monitoring requirement. The station is approximately one mile from the proposed site, and its data were representative of the ambient air in the local area. The 2004 monitoring data indicated that the SO_2 concentrations were 10 $\mu g/m^3$ (annual average), 46 $\mu g/m^3$ (24-hour average), and 147 $\mu g/m^3$ (3-hour average). The modeled SO_2 concentrations from the NAAQS Sources and the Refinery Expansion Project at the monitor receptor were above the monitored values; therefore, no background values were added to the NAAQS modeling results.

Screening dispersion modeling indicated that CO emissions from the proposed Refinery Expansion Project were below the modeling significance impact levels and preconstruction monitoring exemption level. Refined modeling, incremental analysis, and preconstruction monitoring were not required for CO.

VOC emission rate increases from the Refinery Expansion Project were more than 100 tons/yr. An ambient impact analysis, preconstruction, and post construction monitoring were required. Data from the nearby Hahnville Monitoring Station were used to fulfill this requirement. The data indicated that the air quality in the area complies with the national ambient air quality standards (NAAQS). Air quality will also be monitored for one year after plant startup using the Hahnville Monitoring Station.

Emissions of criteria pollutants from the Revised Scope Refinery Expansion Project are less than emissions from the original Refinery Expansion Project. Valero conducted screening dispersion modeling for all criteria pollutants. The results indicated that both the area of impact (AOI) and the maximum offsite ground level concentrations of criteria pollutants emitted from the Revised Scope Refinery Expansion Project are less than those of criteria pollutants emitted from the original Refinery Expansion Project, except concentration of NO_2. Therefore, emissions from the Revised Scope Refinery Expansion

Project will not cause or contribute to any National Ambient Air Quality Standards (NAAQS) exceedances.

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to the Section VIII – General Condition XVII Activities of the proposed permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to the Section IX – Insignificant Activities of the proposed permit.

V. PERMIT SHIELD

This permit does not contain any permit shield.

VI. PERIODIC MONITORING

To demonstrate compliance with applicable standards, emissions from major equipment at the refinery is tested and periodically monitored. Valero will install instrument to monitor NOX and CO emissions from several heaters and boilers, hydrogen sulfide from fuel gas, continuous presence of a flame from flares. Emissions from the flares will be periodically inspected. Fugitive VOC emissions from piping, valves, and flanges will also be monitored as required by LA Refinery MACT and 40 CFR 63 Subpart H.

VII. GLOSSARY

Carbon Monoxide (CO) – A colorless, odorless gas, which is an oxide of carbon.

Maximum Achievable Control Technology (MACT) – The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

Hydrogen Sulfide (H_2S) – A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the reaction of acids on metallic sulfides, and is an important chemical reagent.

New Source Review (NSR) – A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

Nitrogen Oxides (NO_X) – Compounds whose molecules consist of nitrogen and oxygen.

Organic Compound – Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit – Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: $\geq$ 10 tons per year of any toxic air pollutant; $\geq$ 25 tons of total toxic air pollutants; and $\geq$ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10} – Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) – The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Sulfur Dioxide (SO_2) – An oxide of sulfur.

Sulfuric Acid (H_2SO_4) – A highly corrosive, dense oily liquid. It is a regulated toxic air pollutant under LAC 33:III.Chapter 51.

Title V Permit – See Part 70 Operating Permit.

Volatile Organic Compound (VOC) – Any organic compound, which participates in atmospheric photochemical reactions; that is, any organic compound other than those, which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.